

Discussion on "The LANL Advanced Accelerator Applications (AAA) Program" by Dale Schrage

For future work at LANL the idea of using a 5-gap spoke resonator at $\beta=0.125$ was presented. Again the question on the related beam-dynamics simulations was raised. Schrage explained that the original $\beta=0.175$ 2-gap structure was needed due to the 100 mA beam requirement. Now that this was dropped the 13-20 mA beam does allow lower β . Preliminary beam-dynamics has been done that shows the feasibility of the $\beta=0.125$, 5-gap structure. This solution has a much better real estate gradient than the original high current design.

Delayen pointed out that ANL at some point had a design for a high intensity linac that would have used $\beta=0.125$ spoke resonators. The high current there had even required using superconducting focusing elements very close to the cavities to maintain the longitudinal beam quality.

While a lot of designs require short spoke resonators after the RFQ, even for low beam current, LANL's advantage is that the RFQ is already providing a beam at 7 MeV, which allows longer focusing periods. The LANL RFQ on the other hand is optimized for 100 mA and cheaper, more optimized solutions could be envisioned if the front-end would have been designed for the lower beam currents needed for ADS systems.